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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re Reissue Patent Application of:)
Inventor's name(s) Michael A. TZANNES et al.) Group Art Unit:
Patent No. 6,252,909) Examiner:
Filed: February 25, 1997)
For: MULTI-CARRIER TRANSMISSION)
SYSTEM UTILIZING CHANNELS OF)
DIFFERENT BANDWIDTH)

PETITION FOR ACCEPTANCE OF APPLICATION UNDER 37 C.F.R. §1.47(a)

Commissioner for Patents
Arlington, VA 22202

Sir:

In accordance with 37 C.F.R. §1.47(a), Applicants hereby respectfully petition the Commissioner to accept the attached executed Reissue Declaration for the above-identified application on behalf of the signing inventors for the inventors that are not reachable. The required fee of \$130.00 for consideration of this Petition Under 37 C.F.R. §1.47(a) is enclosed herewith.

The accompanying Statement of Facts by Mr. Kevin Russell, Corporate Counsel for Aware, Inc., outlines the measures that were taken in an effort to secure the non-signing inventors' signatures on the Reissue Declaration. The last known addresses of the non-signing inventors are as follows:

12/11/2003 HDAHTE1 00000086 501165 10603833
02 FC:1460 130.00 OP
Sriram JAYASIMHA
2602 Stearms Hill Road
Apt. # 1020
Waltham, MA 02451

William R. MORRELL
401 E. Mercer, St. #8
Seattle, WA 98102

In light of the above, and the attached documentation, Applicants respectfully request the Attached Reissue Declaration be accepted on behalf of the non-signing inventors.

REISSUE APPLICATION DECLARATION BY THE INVENTOR

Docket Number (optional)

081513-328

As a below named inventors, We hereby declare that:

Our residence, mailing address and citizenship are stated below next to our names.

We believe we are the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventors (if plural names are listed below) of the subject matter which is described and claimed in patent number 6,252,909, granted June 26, 2001 and for which a reissue patent is sought on the invention entitled MULTI-CARRIER TRANSMISSION SYSTEM UTILIZING CHANNELS OF DIFFERENT BANDWIDTH, the Specification and Preliminary Amendment therefore which

- ☐ are attached hereto.
- ☒ were filed on June 26, 2003 as Reissue Application Number 10/603,833 and amended concurrently herewith in a Second Preliminary Amendment.
(If applicable)

We have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

We acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

We verily believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)

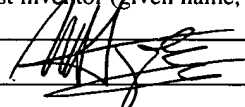
- ☐ by reason of a defective specification or drawing.
- ☒ by reason of the patentee claiming more or less than he had the right to claim in the patent.
- ☐ by reason of other errors.

At least one error upon which reissue is based is described below. If the reissue is a broadening reissue, such must be stated with an explanation as to the nature of the broadening:

Claims have been added to more broadly claim the tree-structured filter bank as taught in the specification as originally filed.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)				Docket Number (optional) 081513-328	
All errors corrected in this reissue application arose without any deceptive intention on the part of the applicant. As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the United States Patent and Trademark Office connected therewith.					
Name(s) Jason H. Vick		Registration Number 45,285			
I/We hereby appoint:					
Practitioners at Customer Number 00181 as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.					
Correspondence Address: Direct all communications about the application to:					
<input checked="" type="checkbox"/> Customer Number		<div style="border: 1px solid black; padding: 2px; display: inline-block;">00181</div> <i>Type Customer Number here</i>		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <i>Place Customer Number Bar Code Label here</i> </div>	
<input type="checkbox"/> Firm or Individual Name					
Address					
Address					
City		State		Zip	
Country					
Telephone		Fax			
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this declaration is directed.					
Full name of sole or first inventor (given name, family name) Michael A. TZANNES					
Inventor's signature 				Date <i>Nov 7, 2003</i>	
Residence				Citizenship: USA	
Mailing Address 17 Carley Road, Lexington, MA 02173, United States of America					
Full name of second joint inventor (given name, family name) Peter N. HELLER					
Inventor's signature <i>Peter N. Heller</i>				Date <i>Nov 7, 2003</i>	
Residence				Citizenship <i>USA</i>	
Mailing Address <i>30 Wallace Street, Somerville, MA 02144</i>					
Full name of third joint inventor (given name, family name) John P. STAUTNER					
Inventor's signature <i>John P. Stautner</i>				Date <i>November 16, 2003</i>	
Residence <i>24 PASTORAL POND CIR, THE WOODLANDS, TX</i>				Citizenship <i>USA</i>	
Mailing Address <i>SAME 77380</i>					
Full name of sole or first inventor (given name, family name) William R. MORRELL					

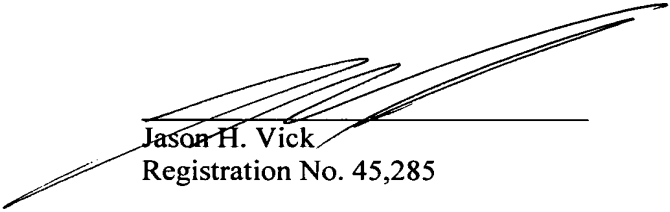
Inventor's signature	Date
Residence	Citizenship
Mailing Address	
Full name of sole or first inventor (given name, family name) Sriram JAYASIMHA	
Inventor's signature	Date
Residence	Citizenship
Mailing Address	

Furthermore, as specified in M.P.E.P. 409.03(a), Applicants respectfully request the attached Reissue Declaration with the non-signing inventors' signatures left blank be treated as having been signed by all of the available joint inventors on behalf of the non-signing inventors.

Should the Office require any additional information to satisfy this Petition, the Office is encouraged to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

MILES & STOCKBRIDGE P.C.



Jason H. Vick
Registration No. 45,285

MILES & STOCKBRIDGE P.C.
1751 Pinnacle Drive, Suite 500
McLean, VA 22102
(703)903-9000

Docket No. T3653-8793US05

Patent No. 6,252,909

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re Reissue Patent Application of:)
Inventor's name(s) Michael A. TZANNES et al.) Group Art Unit:
Patent No. 6,252,909) Examiner:
Filed: February 25, 1997)
For: MULTI-CARRIER TRANSMISSION)
SYSTEM UTILIZING CHANNELS OF)
DIFFERENT BANDWIDTH)

**STATEMENT OF FACTS FOR APPLICATION FOR PATENT WHEN AN
INVENTOR(S) CANNOT BE REACHED**

Commissioner for Patents
Arlington, VA 22202

Sir:

I, Kevin T. Russell, Corporate Counsel for Aware, Inc., submit that I have attempted to contact the non-signing inventors for the above-identified Reissue Application Declaration in an attempt to secure their signatures. However, after diligent effort, I have been unable to locate the two non-signing inventors.

Attached hereto are the following Exhibits:

- 1) The results of the US Search TM for Mr. Morrell and Mr. Jayasimha;
- 2) November 13, 2003 Letter to Mr. Morrell requesting signature and forwarding copy of Reissue Application;
- 3) November 13, 2003 Letter to Mr. Jayasimha requesting signature and forwarding copy of Reissue Application;
- 4) FedEx delivery attempt shipping results for Package Tracking No. 791062496411 sent to Mr. Morrell;
- 5) FedEx delivery attempt shipping results for Package Tracking No. 791062514767 sent to Mr. Jayasimha;
- 6) FedEx Return to Sender (i.e., Aware, Inc.) letters for each of the above packages;

Docket No. 081513-2
Patent No. 6,252,909
Page 2

- 7) Assignment for 08/804,909, Now U.S. Patent No. 6,252,909 signed by Mr. Michael Tzannes and Mr. Peter Heller;
- 8) Assignment for U.S. Patent No. 5,408,580 recorded at Reel/Frame 6296/0332, 6332/0749 and 6299/0913 (6 Pgs.)
- 9) Employment Agreement of Mr. William Morrell;
- 10) Non-Disclosure, Non-Competition and Intellectual Property Agreement of Mr. Sriram Jayasimha
- 11) Consulting Agreement for Mr. John Stautner; and
- 12) August 1997 Petition Under 37 C.F.R. 1.47 and supporting documentation evidencing inventorship and assignment of rights to Aware, Inc..

In an effort to contact the two non-signing inventors, I performed a US Search TM at www.USSEARCH.com for Mr. Morrell and Mr. Jayasimha. The results of the US Search TM for Mr. Morrell revealed two Addresses, a Mercer Street address and a Ravenna Avenue address, both in Seattle. Knowing the Mercer Street address to be the last known good address, I forwarded the accompanying November 13, 2003 letter along with a complete copy of the Reissue Specification as filed in accordance with MPEP 409.03(d). However, as evidenced by the attached FedEx letters dated December 1 and 5, 2003 and the associated FedEx Tracking Results, the package was returned to Aware, Inc. as being undeliverable due to the recipient not being at the provided address.

For Mr. Jayasimha, the results of the US Search TM revealed no matching records for a Mr. Siriam Jayasimha. Accordingly, I forwarded the accompanying November 13, 2003 letter along with a complete copy of the Reissue Specification as filed to Mr. Jayasimha's last known address in accordance with MPEP 409.03(d). However, as evidenced by the attached FedEx letter dated December 1, 2003, and the associated FedEx Tracking Results, the package was returned to Aware, Inc. as being undeliverable due to the recipient not being at the provided address.

Docket No. 081513-2

Patent No. 6,252,909

Page 3

In light of the inability to contact the non-signing inventors, the attached obligations, and in accordance with 37 C.F.R. §1.47(a), acceptance of the accompanying Reissue Declaration signed on behalf of the non-signing inventors by another co-inventor is respectfully requested.

December 9, 2003

Date



Kevin Russell
Corporate Counsel
Aware, Inc.



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EXHIBIT

Need Expert Help? Call 1-800-US-SEARCH (1-800-877-3272) Mon-Fri: 6am-10pm PST / Sat-Sun: 7am-8pm PST

Change Category:

Search Again

Back to Results

Search Options for:

Name
WILLIAM R MORRELLCity
SEATTLEState
WAAge
39

Basic Search Services:

*GUARANTEE: NO RESULTS - NO CHARGE

[Compare Products](#) [View All Pro](#)Basic People Search
for "WILLIAM R MORRELL"

\$9.95

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Buy

\$59.95

Buy

Results Included:

*GUARANTEE:
NO RESULTS - NO CHARGE

Results Included:

*GUARANTEE:
NO RESULTS - NO CHARGE

Results Included:

*GUARANTEE:
NO RESULTS - NO CHARGE

- Complete address in:
"SEATTLE, WA"

- Full reported name

NEW FEATURE: Unlimited Access for 24hrs to the powerful Basic People Locate Search Database. (details)

- Current and previous addresses

- Phone numbers (if available)

- Possible aliases

- Current Full Names

- Deceased Search

NEW FEATURE: Unlimited Access for 24hrs to the powerful Basic People Locate Search Database. (details)

- Location Specialist ensures you get the best possible results

- Current Address and up to 10 year history & available listed phone numbers

- Relatives, roommates and neighbors

- Bankruptcies, Tax liens, Small Claims Civil Judgments *

- Marriage and Divorces *

- Real property ownership and value *

- Full name and possible aliases

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and more

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Background Search Services:

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for "WILLIAM R MORRELL"

\$39.95

Buy

\$59.95

Buy

\$99.95

Buy

Results Included:

Results Included:

*GUARANTEE:
NO RESULTS - NO CHARGE

Results Included:

*GUARANTEE:
NO RESULTS - NO CHARGE

- Bankruptcies - All 50 States and the District of Columbia

- Tax liens *

- Small Claims Civil Judgments *

- State Criminal Search Includes:

- Case number and charge
- Offense, arrest, file, and disposition date
- Disposition & sentence

- Current address and up to 10 year history with available listed phone numbers!

- Bankruptcies, Tax liens* and Small Claims Civil Judgments*

- Real property ownership and value*

- Relatives, roommates and neighbors

- Background Specialist ensures you get the best possible results

- Comprehensive Locate Search includes:

- Current Address and up to 10 year history & available listed phone numbers.

- Nationwide Criminal Search includes:

- Case number, charge, offense, arrest, file, disposition date, disposition and sentence. Over 45 states searched*

- Free Local and National media web-based search including over 675 sources.

and more...

and more...

and more

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Russell, Kevin

From: US Search Result [results@ussearch.com]
Sent: Thursday, November 13, 2003 3:21 PM
To: KRUSSELL@AWARE.COM
Subject: Search Results from USSearch.com

Dear Customer,

Thank you for ordering US SEARCH's Product.

The below copy of your search results have been emailed for your convenience.

Search Results:

#	Name	Gender	Street Address	City	State	Zip	Phone	More
1	<u>WILLIAM R MORRELL</u>		401 E MERCER ST 8	SEATTLE	WA	98102	Click for Phone	More
2	<u>WILLIAM R MORRELL</u>		8627 RAVENNA AVE NE	SEATTLE	WA	98115	Click for Phone	More

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*Credit expires in 30 days.

\$9.95 Credit* towards one of the following services on WILLIAM R MORRELL:

#	Name	Available Services (click on a service below to learn more)	Purchase Price
1	WILLIAM R MORRELL	<u>Advanced People Locate Search for WILLIAM R MORRELL</u> Current and previous addresses, Phone numbers*, Possible aliases, Current Full Names, Deceased Search	\$39.95 \$29.95
2	WILLIAM R MORRELL	<u>Expert Assisted People Locate Search for WILLIAM R MORRELL</u> Search Expert performs your search to ensure optimal results including current address with up to 10 year history, available phone numbers, relatives, roommates and neighbors, real property ownership and more...	\$59.95 \$49.95

Other Popular Searches on WILLIAM R MORRELL:

#	Name	Available Services (click on a service below to learn more)	Purchase Price
1	WILLIAM R MORRELL	<u>Basic Background Search</u>	<u>Bu</u>
2	WILLIAM R MORRELL	<u>Criminal Records</u>	<u>Bu</u>
3	8627 RAVENNA AVE NE	<u>Real Property Ownership</u>	<u>Bu</u>


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First Name

Middle Initial

Last Name(req)

Search Type

Sriram

Jayasimha

☒ People

City

State

Approx. Age (req)

☐ Backgro

Massachusetts

46

Search

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(1-800-877-3272)

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apply**More Searches
For:****"Sriram
Jayasimha"**[-Criminal Records](#)[-Property
Ownership](#)[-Basic Background](#)[-More...](#)**Results for SmartSearch modified criteria:**

First Name: S

Middle Name:

Last Name: Jayasimha

City:

State: MA

Approx Age:

Select the person you are searching for:

GUARANTEE: NO RESULTS -*Search Results - 4 Records Found**[View Sample](#)Option 1 - Click on the name to get the **current or historical address**. (From \$9.95 - Internet COption 2 - Basic address information for all 4 records (\$14.95 - Internet Only)

#	Name	City	State
1	SRIRAN JAYASIMHA	BOSTON	MA
2	SRIRAN JAYASIMHA	CAMBRIDGE	MA
3	SRIRAN JAYASIMHA	WALTHAM	MA
4	SUMEDHA JAYASIMHA	CAMBRIDGE	MA

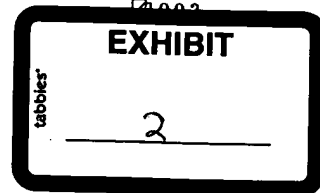
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A W A R E

**VIA FEDERAL EXPRESS**

November 13, 2003

William R. Morrell
401 E. Mercer Street, #8
Seattle, WA 98102

Re: U.S. Patent Application Serial No. 10/603,833 "Multi-Carrier Transmission System Utilizing Channels Of Different Bandwidth" by Tzannes et al.

Dear Mr. Morrell:

Aware has filed a reissue application based on U.S. Patent 6,252,909 on which you are listed as an inventor. Accordingly, you have been named as an inventor on the reissue application. Please find enclosed the following documents:

- 1) Reissue Application Declaration;
- 2) Preliminary Amendment;
- 3) Second Preliminary Amendment;
- 4) A copy of U.S. Patent 6,252,909; and
- 5) A copy of your Employee Agreement.

Pursuant to Section 9 of the Employee Agreement, you agreed to assign all Inventions to Aware and agreed to execute all documents necessary in applying for and obtaining patents. Therefore, please sign and date the enclosed Reissue Application Declaration and return it in the enclosed Federal Express packet to my attention as soon as possible.

If you have any questions, please do not hesitate to contact me (781) 687-0335.

Very truly yours,

Kevin T. Russell
Corporate Counsel

Encl.



A W A R E

VIA FEDERAL EXPRESS

November 13, 2003

Sriram Jayasimha
2602 Stearns Hill Road, Apt. 1020
Waltham, MA 02154

Re: U.S. Patent Application Serial No. 10/603,833 "Multi-Carrier Transmission System Utilizing Channels Of Different Bandwidth" by Tzannes et al.

Dear Mr. Jayasimha:

Aware has filed a reissue application based on U.S. Patent 6,252,909 on which you are listed as an inventor. Accordingly, you have been named as an inventor on the reissue application. Please find enclosed the following documents:

- 1) Reissue Application Declaration;
- 2) Preliminary Amendment;
- 3) Second Preliminary Amendment;
- 4) A copy of U.S. Patent 6,252,909; and
- 5) A copy of your Employee Agreement.

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If you have any questions, please do not hesitate to contact me (781) 687-0335.

Very truly yours,

Kevin T. Russell
Corporate Counsel

Encl.

Customer Relations
3875 Airways Boulevard, 3rd Floor
Memphis, TN 38116

Telephone 901 348.9306
Fax 901 922.1539

EXHIBIT

tabbies

6



IA FACSIMILE

December 5, 2003

Cesar D'Olivera
Aware, Inc.
40 Middlesex Turnpike
Bedford, MA 01730
Fax # 781-276-4001

RE: Package Tracking Number 791062496411

Dear Mr. D'Olivera:

This is in response to your request for documentation regarding your November 13th shipment to William R. Morrell, in Seattle, WA.

Our records indicate this shipment was sent via FedEx Standard Overnight Service, for delivery by 3:00 p.m. on November 14th. Delivery was attempted at 1:34 p.m. on the 14th, when our courier indicated that the recipient was not at the address provided. The shipment was returned on package tracking number 649183831280, and delivery to you was completed at 11:07 a.m. on November 26th, signed for by "T. Patel."

I hope this information proves to be helpful.

Sincerely,

Clay Smith
Customer Relations Department

cs/175326

FedEx Express
Customer Support
Domestic Trace
3875 Airways Boulevard
Module H, 4th Floor
Memphis, TN 38116

U.S. Mail: PO Box 727
Memphis, TN 38194-4843

Telephone 901-369-3800



December 01, 2003

CESAR DOLIVEIRA
(781) 276-4001

Dear CESAR DOLIVEIRA:

Our records reflect the following delivery information for the shipment with the tracking number 649183831280. The information is incomplete and we regret the inconvenience this may cause. However, as stated in the FedEx Service Guide, we assume no liability for our inability to provide a copy of the delivery record.

Delivery Information:

Signed For By: T.PATEL

Delivered to: 40 MIDDLESEX TURNPIKE

Delivery Date: November 26, 2003

Delivery Time: 11:07 AM

Shipping Information:

Tracking No: 649183831280

Ship Date: November 24, 2003

Shipper: CUSTOMER SERVICE
FEDEX BFI SEATTLE
651 S ALASKA ST
SEATTLE, WA 98108
US

Recipient: RETURNS
AWARE INC
40 MIDDLESEX TPKE
BEDFORD, MA 01730
US

Thank you for choosing FedEx Express. We look forward to working with you in the future.

FedEx Worldwide Customer Service
1-800-Go-FedEx (1-800-463-3339)
Reference No: R2003120100102310381

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Ship date Nov 13, 2003Reference number WILLIAM R. MORR
Delivery location SEATTLE WA
Service type Standard Pak

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Date/Time	Status	Location	Comments
Nov 24, 2003 12:53 pm	Package status	SEATTLE WA	Pkg returned to shipper
Nov 21, 2003 12:26 pm	Package status	SEATTLE WA	Package in FedEx location
Nov 19, 2003 11:11 am	Package status	SEATTLE WA	Package in FedEx location
Nov 18, 2003 7:16 pm	Package status	SEATTLE WA	Package in FedEx location
Nov 17, 2003 7:14 pm	Package status	SEATTLE WA	Package in FedEx location
Nov 14, 2003 7:04 pm	Package status	SEATTLE WA	Package in FedEx location
5:59 pm	Package status	SEATTLE WA	Package in FedEx location
1:34 pm	Delivery attempt	SEATTLE WA	Incorrect address
12:05 pm	Arrived at Sort Facility	MEMPHIS TN	
8:18 am	On FedEx vehicle for delivery	SEATTLE WA	
7:34 am	Arrived at FedEx Destination Location	SEATTLE WA	
6:31 am	Left FedEx Ramp	SEATTLE WA	
5:25 am	Arrived at FedEx Ramp	SEATTLE WA	

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Enter your email, submit up to three email addresses (separated by commas), add your message (optional), and click **Send email**.

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To

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FedEx Ship Manager QuickShip Shipment Receipt

From:

AWARE, INC.
40 - MIDDLESEX TPKE
BEDFORD MA 01730
7816870340

To:

WILLIAM R. MORRELL
-
401 E. MERCER STREET #8
-
SEATTLE WA
0000000000

COD Return Address:
N/A

Date: 11/13/2003

Track Number: 791062496411

Service: FedEx Express Standard Overnight Pak

Packaging: FedEx Pak

Special Handling: N/A

Piece: 1 of 1

Weight: 2.0000 LBS

Dimensions: N/A

Declared Value: N/A

Deliver without Signature: No

Billing: Bill Sender

Bill To Acct: 105738056

Rate Quote: 25.03

Reference: WILLIAM R. MORR

COD Shipment: No

COD Amount: N/A

Secured Check: N/A

Include Freight: N/A

Document Shipment: N/A

Commodities: N/A

Total Customs Value: N/A

Currency: N/A

Countries of MFG: N/A

Export License: N/A

Expire: N/A

License Exception Symbol: N/A

ECCN: N/A

Ultimate Destination: N/A

TERMS AND CONDITIONS

For complete terms and conditions see the FedEx Ship Manager QuickShip License

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You are responsible for and warrant compliance with all applicable laws, rules and regulations, including but not limited to, customs laws, import and export laws and government regulations of any country to, from, through or over which your shipment may be carried. You agree to furnish such information and complete and attach to this shipment such documents, or submit shipment data to FedEx, as necessary to comply with such laws, rules and regulations. FedEx assumes no liability to You or any other person for any loss or expense due to Your failure to comply with this provision.

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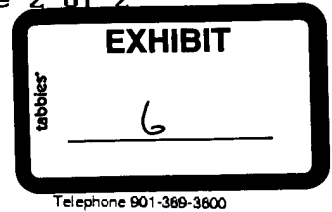
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December 01, 2003

CESAR DOLIVEIRA
(781) 276-4001

Dear CESAR DOLIVEIRA:

Our records reflect the following delivery information for the shipment with the tracking number 617506142492. The information is incomplete and we regret the inconvenience this may cause. However, as stated in the FedEx Service Guide, we assume no liability for our inability to provide a copy of the delivery record.

Delivery Information:

Signed For By: T.PETEL

Delivered to: CORPORA COUNSEL

Delivery Date: November 25, 2003

Delivery Time: 10:03 AM

Shipping Information:

Shipment Reference Information: 791062514767B

Tracking No: 617506142492

Ship Date: November 24, 2003

Shipper: FDX/OWDA STATION
151 3RD AVE
NEEDHAM, MA 024942711
US

Recipient: SHIPPING
AWARE INC
40 MIDDLESEX TPKE
BEDFORD, MA 01730
US

Thank you for choosing FedEx Express. We look forward to working with you in the future.

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Reference No: R2003120100102336253

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FedEx Ship Manager QuickShip Shipment Receipt

From:

AWARE, INC.
40 - MIDDLESEX TPKE
BEDFORD MA 01730
7816870340

To:

SRIRAM JAYASIMHA
-
2602 STEARMS HILL ROAD
APT# 1020
WALTHAM MA
0000000000

COD Return Address:
N/A

02451

Date: 11/13/2003

Track Number: 791062514767

Service: FedEx Express Priority Overnight

Packaging: Customer Packaging

Special Handling: N/A

Piece: 1 of 1

Weight: 2.0000 LBS

Dimensions: N/A

Declared Value: N/A

Deliver without Signature: No

Billing: Bill Sender

Bill To Acct: 105738056

Rate Quote: 15.52

Reference: SRIRAM JAYASIMH

COD Shipment: No

COD Amount: N/A

Secured Check: N/A

Include Freight: N/A

Document Shipment: N/A

Commodities: N/A

Total Customs Value: N/A

Currency: N/A

Countries of MFG: N/A

Export License: N/A

Expire: N/A

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TERMS AND CONDITIONS

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Agreement to Terms. By giving FedEx Your shipment, You agree to be bound by the terms and conditions specified in this document, the FedEx Service Guide and the FedEx Ship Manager QuickShip License. You previously executed, all of which are incorporated herein by reference, for carriage of the shipment via FedEx delivery services to destinations located outside the United States. If there is a conflict between this document and the FedEx Ship Manager QuickShip License, the FedEx Service Guide ("Service Guide") or the Standard Condition of Carriage (which are available upon request from FedEx), then in effect, the Service Guide or Standard Conditions will control, as applicable.

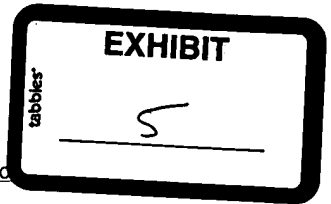
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You are responsible for and warrant compliance with all applicable laws, rules and regulations, including but not limited to, customs laws, import and export laws and government regulations of any country to, from, through or over which your shipment may be carried. You agree to furnish such information and complete and attach to this shipment such documents, or submit shipment data to FedEx, as necessary to comply with such laws, rules and regulations. FedEx assumes no liability to You or any other person for any loss or expense due to Your failure to comply with this provision.

Letter of Instruction. If You do not complete all the documents required for carriage or if the documents submitted are not appropriate for the services or the destination requested, You hereby instruct FedEx, where permitted by law to complete, correct or replace the documents for You at Your expense. However, FedEx is not obligated to do so. If a substitute form of air waybill is needed to complete delivery of Your shipment and FedEx completes that document, the terms of the FedEx Ship Manager QuickShip License and this document will continue to govern. FedEx is not liable to You or any other person for FedEx's actions on Your behalf under this provision.

Export Control. You authorize FedEx to act as forwarding agent for You for export and customs purposes. You hereby certify that all statements and information contained on air waybills and SEDs relating to exportation are true and correct. You further certify that all Commercial Invoice information submitted via FedEx Ship Manager QuickShip is true and correct. You expressly authorize FedEx to forward all information of any nature regarding any shipment to any and all governmental or regulatory agencies which request or require such information. You acknowledge that civil and criminal penalties, including forfeiture and sale may be imposed for making false or fraudulent statements or for the violation of any United States laws on exportation, including but not limited to, 13 U.S.C. § 305; 22 U.S.C. § 401; 18 U.S.C. § 1001; and 50 U.S.C. App. 2410. You acknowledge that this shipment is not being sent to any entity listed on the Department of Commerce's Denied Parties List 15 C.F.R. Part 764, Supp. 2, or the list of Special Designated Nationals as published by the Office of Foreign Assets Control of the U.S. Department of the Treasury.

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Tracking number 791062514767
Ship date Nov 13, 2003

Reference number SRIRAM JAYASIMH
Delivery location REVERE MA
Service type Priority Overnight

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Date/Time	Status	Location	Comments
Nov 24, 2003 12:41 pm	Package status	NEEDHAM MA	Pkg returned to shipper
9:28 am	Package status	NEEDHAM MA	Package in FedEx location
Nov 21, 2003 10:19 pm	Package status	NEEDHAM MA	Package in FedEx location
10:28 am	Package status	NEEDHAM MA	Package in FedEx location
Nov 20, 2003 10:17 pm	Package status	NEEDHAM MA	Package in FedEx location
9:33 am	Package status	NEEDHAM MA	Package in FedEx location
Nov 19, 2003 10:16 pm	Package status	NEEDHAM MA	Package in FedEx location
7:31 pm	Package status	NEEDHAM MA	Package in FedEx location
5:00 pm	Delivery attempt	NEEDHAM MA	Incorrect address
8:17 am	On FedEx vehicle for delivery	NEEDHAM MA	
Nov 18, 2003 11:09 am	Package status	NEEDHAM MA	Package in FedEx location
Nov 17, 2003 7:54 pm	Package status	NEEDHAM MA	Package in FedEx location
3:54 pm	Package status	NEEDHAM MA	Package in FedEx location

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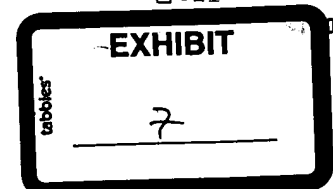
Enter your email, submit up to three email addresses (separated by commas), add your message (optional), and click **Send email**.

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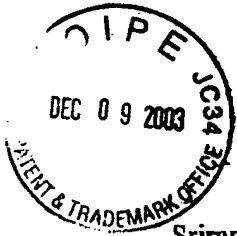
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Attorney Docket No. AWR-020
(457/22)



ASSIGNMENT

WHEREAS, We, Michael Tzannes, Peter Niels Heller, John P. Stautner, William R. Morrell and Sriram Jayasinha have invented one or more improvements in:

Multi-Carrier Transmission System Utilizing Channels Of Different Bandwidth

described in an application (or provisional application) for Letters Patent of the United States:

- ☐ Identified by Attorney Docket No. , and/or executed by us of even date herewith and about to be filed in the United States Patent Office;
- ☒ Serial No. 08/804,909 filed in the United States Patent Office on February 25, 1997; and

WHEREAS, Aware, Inc. (hereinafter "ASSIGNEE"), a corporation organized and existing under the laws of the Commonwealth of Massachusetts, and having a usual place of business at 400 Middlesex Turnpike, Bedford, Massachusetts 01730 desires to acquire an interest therein, in accordance with agreements duly entered into with us;

NOW, THEREFORE, to all whom it may concern be it known that for and in consideration of said agreements and of other good and valuable consideration, the receipt of which is hereby acknowledged, we have sold, assigned and transferred and by these presents do hereby sell, assign and transfer unto said ASSIGNEE, its successors, assigns, and legal representatives, our entire right, title and interest in and throughout the United States of America, its territories and all foreign countries, in and to the inventions described in said application, together with our entire right, title and interest in and to said application and such Letters Patent as may issue thereon or claim priority under international convention, including but not limited to continuations, divisionals, reissues, and reexaminations of said application of such Letters Patent; said inventions, applications and Letters Patent to be held and enjoyed by said ASSIGNEE for its own use and behalf and for its successors, assigns and legal representatives, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held by us had this assignment and sale not been made; we hereby convey all of our rights arising under or pursuant to any and all international agreements, treaties or laws relating to the protection of industrial property by filing any such applications for Letters Patent. We hereby acknowledge that this assignment, being of our entire right, title and interest in and to said inventions, carries with it the right in ASSIGNEE to apply for and obtain from competent authorities in all countries of the world any and all Letters Patent by attorneys and agents of ASSIGNEE's selection and the right to procure the grant of all Letters Patent to ASSIGNEE for its own name as assignee of our entire right, title and interest therein.

AND, we hereby further agree for ourselves and our executors and administrators to execute upon request any other lawful documents and likewise to perform any other lawful acts which may be deemed necessary to secure fully the aforesaid invention to said ASSIGNEE, its successors, assigns, and legal representatives, but at its or their expense and charges, including: the execution of applications for patents in foreign countries; the execution of substitution, reissue, divisional or continuation applications; and preliminary or other statements or the giving of testimony in any interference or other proceeding in which said inventions or any application or patent directed thereto may be involved; and

J int Assignment
Serial N . 08/804,909
Page 2

we further hereby authorize ASSIGNEE or its attorneys or agents to insert the correct serial number and filing date into this assignment, if none is indicated on that date of our execution of this assignment;

AND, we do hereby authorize and request the Commissioner of Patents of the United States to issue such Letters Patent as shall be granted upon said application or applications based thereon to said ASSIGNEE, its successors, assigns, and legal representatives.

IN TESTIMONY WHEREOF, we have hereunto set our hands and affixed our seals the date set forth below.

Inventor:


Michael A. Tzannes

Commonwealth of Massachusetts)
County of Middlesex) ss

Subscribed and sworn to before me, by the above-named Michael A. Tzannes this 6th day of April, 2000.


Notary Public

My Commission Expires: 4/19/02

Inventor:


Peter Niels Heller

Commonwealth of Massachusetts)
County of Middlesex) ss

Subscribed and sworn to before me, by the above-named Peter Niels Heller this 6th day of April, 2000.


Notary Public

My Commission Expires: 4/19/02

Joint Assignment
Serial No. 08/804,909
Page 3

Inventor: _____

John P. Stautner

Commonwealth of Massachusetts)
County of) ss

Subscribed and sworn to before me, by the above-named John P. Stautner this _____ day of _____, 2000.

Notary Public

My Commission Expires: _____

Inventor: _____

William R. Morrell

Commonwealth of Massachusetts)
County of) ss

Subscribed and sworn to before me, by the above-named William R. Morrell this _____ day of _____, 2000.

Notary Public

My Commission Expires: _____

Inventor: _____

Sriram Jayasimha

Commonwealth of Massachusetts)
County of) ss

Subscribed and sworn to before me, by the above-named Sriram Jayasimha this _____ day of _____, 2000.

Notary Public

My Commission Expires: _____

DATE: 12/01/92

TO:

CALVIN B. WARD

MCCUBBREY BARTELS ET AL.

ONE POST STREET, SUITE 2700

SAN FRANCISCO, CA 94104-5231

ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

EXHIBIT

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DEC 09 2003

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ASSIGNOR:

MORRELL, WILLIAM R.

DOC DATE: 09/18/92

RECORDATION DATE: 11/12/92 NUMBER OF PAGES 002 REEL/FRAME 6296/0332

DIGEST :ASSIGNMENT OF ASSIGNORS INTEREST

ASSIGNEE:

AWARE, INC.

ONE MEMORIAL DRIVE, 4TH FLOOR

CAMBRIDGE, MA 02142-1301

SERIAL NUMBER 7-948147

FILING DATE 09/21/92

PATENT NUMBER

ISSUE DATE 00/00/00

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ASSIGNMENT BRANCH

ASSIGNMENT/CERTIFICATION SERVICES DIVISION

RECEIVED
DEC 28 1992MCCUBBREY, BARTELS,
MEYER & WARD

28

ASSIGNMENT

I, William R. Morrell, of Somerville, County of Middlesex, and State of Massachusetts, for good and valuable consideration, receipt of which is hereby acknowledged, have assigned and do hereby assign to Aware, Inc., a Massachusetts corporation having its principle place of business at One Memorial Drive, Cambridge, Massachusetts 02142-1301, its successors, assigns and legal representatives, the entire right, title and interest in and to all subject matter invented by me and disclosed in the application for Letters Patent of the United States entitled

"IMPROVED AUDIO COMPRESSION SYSTEM EMPLOYING MULTI-RATE SIGNAL ANALYSIS"

U.S. Serial No. 07/948, 147, filed September 21, 1992 (Attorney Docket No. 51692); and in and to all Letters Patent and all Convention and Treaty rights of all kinds, in all countries throughout the world, for all such subject matter. I agree to sign all documents necessary to secure all said Letters Patent and rights, and request issuance of all said Letters Patent to the above assignee in accordance with this assignment.

I further authorize and direct Aware's attorneys to insert the serial number and filing date of said application now identified as Attorney Docket No. 51692 in the space provided above as soon as the same shall have been made known to them by the United States Patent and Trademark Office.

18-Sep-1992, 1992

William R. Morrell
William R. Morrell

COUNTY OF Middlesex)
STATE OF Massachusetts) SS

I hereby acknowledge that, before me in the County of Middlesex, in the State of Massachusetts, personally appeared William R. Morrell who proved to me on the basis of satisfactory evidence to be the same, who then and there was duly sworn by me, and under oath acknowledged that the foregoing assignment was duly signed, sealed and delivered by him on the date appearing at the foot thereof.

September 18 1992
RECORDED
PATENT AND TRADEMARK
OFFICE

NOV 12 1992

Lisa C. Galante
Notary Public - My Commission Expires
LISA C. GALANTE, Notary Public
My Commission Expires June 20, 1997



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

DATE: 01/05/93

TO:

CALVIN B. WARD
MCCUBBREY, BARTELS, MEYER & WARD
ONE POST STREET, SUITE 2700
SAN FRANCISCO, CA 94104-5231

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ASSIGNOR:

DOC DATE: 09/18/92

STAUTNER, JOHN P.

RECORDATION DATE: 10/05/92 NUMBER OF PAGES 003 REEL/FRAME 6332/0749

DIGEST :ASSIGNMENT OF ASSIGNORS INTEREST

ASSIGNEE:

AWARE, INC.
ONE MEMORIAL DRIVE, 4TH FLOOR
CAMBRIDGE, MA 02142-1301

SERIAL NUMBER 7-948147 FILING DATE 09/21/92
PATENT NUMBER ISSUE DATE 00/00/00

EXAMINER/PARALEGAL
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FEB 7 1993
MCCUBBREY, BARTELS,
MEYER & WARD

ASSIGNMENT

I, John P. Stautner, of Wellesley Hills, County of ^{Norfolk}, and State of Massachusetts, for good and valuable consideration, receipt of which is hereby acknowledged, have assigned and do hereby assign to Aware, Inc., a Massachusetts corporation having its principle place of business at One Memorial Drive, Cambridge, Massachusetts 02142-1301, its successors, assigns and legal representatives, the entire right, title and interest in and to all subject matter invented by me and disclosed in the application for Letters Patent of the United States entitled

"IMPROVED AUDIO COMPRESSION SYSTEM EMPLOYING MULTI-RATE SIGNAL ANALYSIS"

U.S. Serial No. 07/948, 147, filed September 21, 1992 (Attorney Docket No. 51692); and in and to all Letters Patent and all Convention and Treaty rights of all kinds, in all countries throughout the world, for all such subject matter. I agree to sign all documents necessary to secure all said Letters Patent and rights, and request issuance of all said Letters Patent to the above assignee in accordance with this assignment.

I further authorize and direct Aware's attorneys to insert the serial number and filing date of said application now identified as Attorney Docket No. 51692 in the space provided above as soon as the same shall have been made known to them by the United States Patent and Trademark Office.

September 18, 1992

John P. Stautner
John P. Stautner

COUNTY OF MIDDLESEX)
STATE OF MASSACHUSETTS) SS

I hereby acknowledge that, before me in the County of MIDDLESEX, in the State of MASSACHUSETTS, personally appeared John P. Stautner who proved to me on the basis of satisfactory evidence to be the same, who then and there was duly sworn by me, and under oath acknowledged that the foregoing assignment was duly signed, sealed and delivered by him on the date appearing at the foot thereof

RECORDED
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SEP 18, 1992

OCT -5 1992

Lisa C. Galante
Notary Public - My Commission Expires
LISA C. GALANTE, Notary Public
My Commission Expires June 20 1997

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OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

DATE: 12/09/92

TO:

CALVIN B. WARD

MCCUBBREY, BARTELS, MEYER & WARD

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ASSIGNOR:

JAYASIMHA, SRIRAM

DOC DATE: 09/18/92

RECORDATION DATE: 11/12/92 NUMBER OF PAGES 002 REEL/FRAME 6299/0913

DIGEST :ASSIGNMENT OF ASSIGNORS INTEREST

ASSIGNEE:

AWARE, INC.

ONE MEMORIAL DRIVE

4TH FLOOR

CAMBRIDGE, MASSACHUSETTS 02142-1301

SERIAL NUMBER 7-948147 FILING DATE 09/21/92

PATENT NUMBER ISSUE DATE 00/00/00

EXAMINER/PARALEGAL

ASSIGNMENT BRANCH

ASSIGNMENT/CERTIFICATION SERVICES DIVISION

RECEIVED
JAN 1 1993

MCCUBBREY, BARTELS,
MEYER & WARD

ASSIGNMENT

I, Sriram Jayasimha, of Boston, County of Suffolk, and State of Massachusetts, for good and valuable consideration, receipt of which is hereby acknowledged, have assigned and do hereby assign to Aware, Inc., a Massachusetts corporation having its principle place of business at One Memorial Drive, Cambridge, Massachusetts 02142-1301, its successors, assigns and legal representatives, the entire right, title and interest in and to all subject matter invented by me and disclosed in the application for Letters Patent of the United States entitled

**"IMPROVED AUDIO COMPRESSION SYSTEM EMPLOYING MULTI-RATE
SIGNAL ANALYSIS"**

U.S. Serial No. 07/948, 147, filed September 21, 1992 (Attorney Docket No. 51692); and in and to all Letters Patent and all Convention and Treaty rights of all kinds, in all countries throughout the world, for all such subject matter. I agree to sign all documents necessary to secure all said Letters Patent and rights, and request issuance of all said Letters Patent to the above assignee in accordance with this assignment.

I further authorize and direct Aware's attorneys to insert the serial number and filing date of said application now identified as Attorney Docket No. 51692 in the space provided above as soon as the same shall have been made known to them by the United States Patent and Trademark Office.

18 September, 1992 Sriram Jayasimha
Sriram Jayasimha

COUNTY OF Middlesex)
STATE OF Massachusetts) SS

RECORDED
PATENT AND TRADEMARK
OFFICE
NOV 12 1992

I hereby acknowledge that, before me in the County of Middlesex, in the State of Massachusetts, personally appeared Sriram Jayasimha who proved to me on the basis of satisfactory evidence to be the same, who then and there was duly sworn by me, and under oath acknowledged that the foregoing assignment was duly signed, sealed and delivered by him on the date appearing at the foot thereof.

September 18, 1992 Lisa C. Galante
Notary Public - My Commission Expires
LISA C. GALANTE, Notary Public
My Commission Expires June 20, 1997

REL 6299 PAGE 14

**AWARE, INC.**

University Place, Suite 310
124 Mount Auburn Street
Cambridge, MA 02138 USA
617 • 354 • 0667 FAX
617 • 354 • 2211

EXHIBIT

tabbles

9

EMPLOYEE AGREEMENT

THIS AGREEMENT is between Aware, Inc., a Massachusetts corporation with principal offices at University Place 124 Mount Auburn St., Suite 310, Cambridge, MA 02138 (hereinafter "the Company"), and William Morrell, (hereinafter "Employee"):

WHEREAS, Employee has been or is being engaged by the Company to work in the position of Member of the Technical Staff, because of employee's intellectual character and extraordinary ability; and

WHEREAS, said employment is of a confidential nature involving duties that require the Company to impose on Employee the highest trust and confidence;

NOW, THEREFORE, in consideration of the initiation or the continuation of employment, of other good and valuable consideration received by Employee, receipt of which is hereby acknowledged, and of the mutual promises and covenants contained herein, the parties agree as follows:

1. Definitions**a. Affiliate**

As used herein, the term "Affiliate" means (1) any entity in which the Company or any of its stockholder, directors or officers has a direct or indirect ownership interest (other than insubstantial interests in publicly held companies) or (2) any entity which directly or indirectly through one or more intermediaries, controls, is controlled by, or is under common control with the Company.

b. Proprietary Information

As used herein, the term "Proprietary Information" refers to any and all information of a confidential, proprietary, or secret nature that is or may be either applicable to, or related in any way to (i) the business, present or future, of the Company or any Affiliate, or (ii) the research and development or investigations of the Company or of any Affiliate. Proprietary Information includes, for example and without limitation, trade secrets, processes, formulas, data, know-how, improvements, inventions, techniques, marketing plans and strategies, and information concerning customers or vendors.

c. Inventions

As used herein, the term "Inventions" refers to all inventions, computer programs, discoveries, improvements, trade secrets, formulas, techniques, processes, confidential information, and know-how, whether or not patentable and whether or not reduced to practice, conceived or learned by Employee during the period of employment, either alone or jointly with others, which relate to or result from the actual or anticipated business, work, research, or investigations of the Company, or any Affiliate, or which result, to any extent, from use of the Company's premises or property.

2. Employment

(a) The Company has hired Employee to work in the position identified above. This employment is not for any particular period, and may be terminated, with or without cause at any time.

(b) Employee agrees to devote his or her full energies, interest, abilities, and productive time to the performance of this Agreement and shall not, without Employer's prior written consent, render to others services of any kind for compensation, or engage in any other business activity, that would materially interfere with the performance of the employee's duties under this agreement. The Agreement applies to Employee's present position as well as any subsequent position held.

(c) Employee acknowledges that, as a part of his or her employment, Employee is expected to create inventions and/or ideas of value for the Company.

3. Confidential Information of Others

If the Employee possesses any confidential information or documents belonging to others, Employee will not use, disclose to the Company, or induce the Company to use, any such information or documents during his or her employment. Employee represents that his or her employment will not require Employee to violate any obligation to or confidence with another.

4. Proprietary Information to be Kept In Confidence

Employee acknowledges that the Proprietary Information is a special, valuable, and unique asset of the Company, and Employee agrees at all times during the period of employment and thereafter to keep in confidence and trust all Proprietary Information. Employee agrees that during the period of employment and thereafter Employee will not directly or indirectly use the Proprietary Information other than in the course of performing duties as an Employee of the Company, nor will Employee directly or indirectly disclose

any Proprietary Information or any information relating thereto to any person or entity, except in the course of performing duties as an Employee of the Company and with the written consent of the Company. Employee will abide by the Company's policies and regulations, as established and revised from time to time, for the protection of its Proprietary Information.

5. Other Employment

Employee agrees that during the period of employment by the Company, Employee will not, without the Company's prior written consent, directly or indirectly engage in any employment, consulting, or activity other than for the Company relating to any line of business in which the Company is now or at such time engaged, or which would otherwise conflict with Employee's obligations to the Company.

6. Covenant Not to Compete

(a) Without the Prior express written consent of the Company, during the period in which Employee is employed by the Company and, subject to subparagraph (b) below, for a period of one (1) year thereafter, Employee agrees not to directly or indirectly anywhere in the world:

(i) engage or participate (with or without compensation) in any commercial research or commercial project which is the same or substantially similar (in purpose, objective or result) to any research or project in which the Company or its Affiliates engaged, participated or researched during the Employment Period; or

(ii) recruit or otherwise solicit or induce any employees of the Company or any of its Affiliates to terminate their employment with, or otherwise cease their relationships with the Company or any of its Affiliates.

(b) It shall not be considered a competitive activity with the meaning of paragraph 6 (a) (i) for Employee to be a member of the faculty or staff of a university, college or other educational or non-profit research institution, provided that Employee does not engage or participate in any commercial research or project prohibited by Section 6 (a) (i) above.

(c) The restrictions against competition set forth in paragraph 6 (a) are considered by the parties to be reasonable for the purposes of protecting the business of the Company. However, if any such restriction is found by any court of competent jurisdiction to be unenforceable because of its temporal extent, geographic extent, or breath of activities, it shall be interpreted to extend only over the maximum period of time, range of activities or geographic areas as to which it may be enforced.

7. Return of Materials at Termination

In the event of termination of employment with the Company for any reason, Employee will promptly deliver to the Company, or any Affiliate designated by it, all Company documents, data, records, and other information, and Employee shall not take any documents or data, or any reproduction or excerpt of any documents or data, containing or pertaining to any Proprietary Information.

8. Disclosure of Inventions to the Company

Employee agrees promptly to disclose in writing to the Company any and all Inventions. For the purpose of this Agreement, an Invention is deemed to have been made during the period of employment if, during such period, the invention was conceived or first actually reduced to practice. Employee further agrees to disclose to the Company in writing and in confidence all patent applications naming Employee as an inventor which are filed within one year after the termination of employment with Company.

9. Inventions as Sole Property of Company

Employee acknowledges and agrees that all the Inventions shall be the sole property of the Company or any other entity designated by it, and Employee hereby assigns to the Company Employee's entire right and interest in all Inventions. Employee will not use for his or her own benefit, directly or indirectly, any of said Inventions. The Company or any other entity designated by it shall be the sole owner of all domestic and foreign rights pertaining to the Inventions. Employee further agrees to assist the Company in every way (at the Company's expense) to obtain and from time to time to enforce patents on the Inventions in any and all countries. To that end, by way of illustration but not limitation, Employee will testify in any suit or other proceeding involving any of the Inventions, execute all documents that the Company reasonably determines to be necessary or convenient for use in applying for and obtaining patents thereon and enforcing the same, and execute all necessary assignments thereof to the Company or entities designated by it. Employee's obligation to assist the Company in obtaining and enforcing patents for the Inventions shall continue beyond the employment termination, but the Company shall compensate Employee at a reasonable rate after such termination for time actually spent by Employee at the Company's request on such assistance.

10. Power of Attorney

Employee hereby grants to the Company a general power of attorney to file patent applications on Inventions in any country in Employee's name and to execute any document connected with such a filing or the prosecution of a patent application naming Employee as an inventor on behalf of Employee.

11. List of Prior Inventions

All inventions, if any, which Employee made prior to employment by the Company which are to be excluded from the scope of this agreement are set forth in Exhibit A attached hereto. Employee represents and covenants that this is a complete list of all inventions, discoveries, or improvements relating to the Company's business that have been made by Employee prior to employment with the Company.

12. Injunction

Employee agrees that it would be difficult to measure damage to the Company from any breach by Employee of the promises set forth in Paragraphs 3, 4, 5, 6 and 7 herein; that injury to the Company from any such breach would be impossible to calculate, and that money damages would therefore be an inadequate remedy for any such breach. Accordingly, Employee agrees that if Employee breaches any provision of these Paragraphs, the Company shall be entitled, in addition to all other remedies it may have, to injunctions or other appropriate orders to restrain any such breach by Employee without showing or proving any actual damage sustained by the Company.

13. General

(a) To the extent that any of the agreements set forth herein, or any word, phrase, clause or sentence thereof, shall be found to be illegal or unenforceable for any reason, such agreement, word, clause, phrase, or sentence shall be modified or deleted in such manner as to make the agreement as modified legal and enforceable under applicable laws, and the balance of the agreements or part thereof shall not be affected thereby, the balance being construed as severable and independent.

(b) This Agreement shall be binding upon Employee and Employee's heirs, executors, assigns, and administrators and shall inure to the benefit of the Company, its successors and assigns, and any Affiliate.

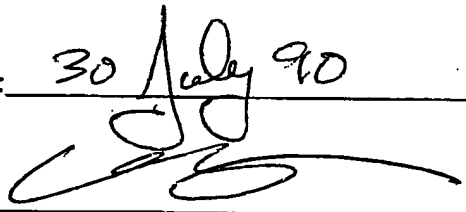
(c) This Agreement shall be governed by the laws of the State of Massachusetts, which state shall have jurisdiction of the subject matter hereof.

(d) This Agreement may be signed in two counterparts, each of which shall be deemed an original and that together shall constitute one instrument.

(e) The use of the singular in this Agreement includes the plural, as appropriate.

(f) This Agreement represents the entire agreement between Employee and the Company with respect to the subject matter hereof, superseding all previous oral or written communications, representations, or agreements. This Agreement may be modified only by a duly authorized representative of the Company and said modification must be executed in writing.

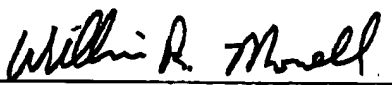
Aware

Dated: 30 July 90
By 
(Signature)

Charles S. Smith

(Typed or Printed Name)

Employee

Dated: 30-July-1990

(Signature)

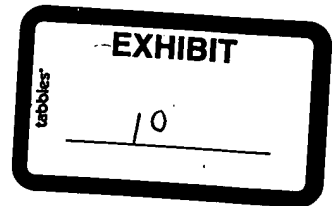
William R. Morrell

(Typed or Printed Name)

EXHIBIT A
LIST OF EMPLOYEE'S INVENTIONS

List each invention, if any, related to the Company's business by title and with a brief summary. State when made and conceived and whether or not a patent has been applied for. Do not list any confidential information.

None related

EXHIBIT C

**NON-DISCLOSURE, NON-COMPETITION,
AND INTELLECTUAL PROPERTY AGREEMENT.**

THIS AGREEMENT is between Aware, Inc., a Massachusetts corporation with principal offices at One Memorial Drive, Cambridge, MA 02142 (hereinafter "the Company"), and Sriram Jayasinha (hereinafter "Consultant").

WHEREAS, Consultant has been or is being engaged by the Company to work in the position of intermittent consultant to develop software, because of Consultant's intellectual character and extraordinary ability; and

WHEREAS, said engagement is of a confidential nature involving duties that require the Company to impose on Consultant the highest trust and confidence;

NOW, THEREFORE, in consideration of the initiation or the continuation of engagement, of other good and valuable consideration received by Consultant, receipt of which is hereby acknowledged, and of the mutual promises and covenants contained herein, the parties agree as follows:

1. Definitions

a. Subsidiary

As used herein, the term "Subsidiary" means any corporation in which not less than 50% of the outstanding capital stock granting voting power to elect a majority of its Board of Directors is owned, directly or indirectly, by the Company.

b. Proprietary Information

As used herein, the term "Proprietary Information" refers to any and all information of a confidential, proprietary, or secret nature that is or may be either applicable to, or related in any way to (i) the business, present or future, of the Company or any Subsidiary, of (ii) the research and development or investigations of the Company or of any Subsidiary. Proprietary Information includes, for example and without limitation, trade secrets, processes, formulas, data, know-how, improvements, inventions, techniques, marketing plans and strategies, and information concerning customers or vendors. In particular, Consultant acknowledges that all information related to the Company's solution of differential and integral equations by wavelet-related methods shall be deemed as proprietary information.

c. Inventions

As used herein, the term "Inventions" refers to all inventions, computer programs, discoveries, improvements, trade secrets, formulas, techniques, processes, confidential information, and know-how, whether or not patentable and whether or not reduced to practice, conceived or learned by Consultant during the period of engagement, either alone or jointly with others, which relate to or result from the actual or anticipated business, work, research, or investigations of the Company, or any Subsidiary, or which result, to any extent, from use of the Company's premises or property.

2. Engagement

(a) The Company has hired Consultant to work on such tasks as shall be specified from time to time. This engagement is not for any particular period, and may be terminated, with or without cause at any time.

(b) Consultant acknowledges that, as a part of his or her engagement, Consultant is expected to create inventions and/or ideas of value for the Company.

3. Confidential Information of Others

If the Consultant possesses any confidential information or documents belonging to others, Consultant will not use, disclose to the Company, or induce the Company to use, any such information or documents during his or her engagement. Consultant represents that his or her engagement will not require Consultant to violate any obligation to or confidence with another.

4. Proprietary Information to be Kept In Confidence

Consultant acknowledges that the Proprietary Information is a special, valuable, and unique asset of the Company, and Consultant agrees at all times during the period of engagement and thereafter to keep in confidence and trust all Proprietary Information. Consultant agrees that during the period of engagement and thereafter Consultant will not directly or indirectly use the Proprietary Information other than in the course of performing duties as an Consultant of the Company, nor will Consultant directly or indirectly disclose any Proprietary Information or any information relating thereto to any person or entity, except in the course of performing duties as an Consultant of the Company and with the written consent of the Company. Consultant will abide by the Company's policies and regulations, as established and revised from time to time, for the protection of its Proprietary Information.

5. Other Engagement

Consultant agrees that during the period of engagement by the Company, and for one year thereafter, he will not directly or indirectly engage in any engagement, consulting, or activity involving the solution of differential and integral equations by wavelet methods other than for the Company which would conflict with Consultant's obligations to the Company.

6. Return of Materials at Termination

In the event of termination of engagement with the Company for any reason, Consultant will promptly deliver to the Company, or any Subsidiary designated by it, all Company documents, data, records, and other information, and Consultant shall not take any documents or data, or any reproduction or excerpt of any documents or data, containing or pertaining to any Proprietary Information.

7. Disclosure of Inventions to the Company

Consultant agrees promptly to disclose in writing to the Company any and all Inventions. For the purpose of this Agreement, an Invention is deemed to have been made during the period of engagement if, during such period, the invention was conceived or first actually reduced to practice. Consultant further agrees to disclose to the Company in writing and in confidence all patent applications naming Consultant as an inventor which are filed within one year after the termination of engagement with Company.

8. Inventions a Sole Property of Company

Consultant acknowledges and agrees that all the Inventions relating to mutually agreed specific tasks shall be the sole property of the Company or any other entity designated by it, and Consultant hereby assigns to the Company Consultant's entire right and interest in all Inventions. Consultant will not use for his or her own benefit, directly or indirectly, any of said Inventions. The Company or any other entity designated by it shall be the sole owner of all domestic and foreign rights pertaining to the Inventions. Consultant further agrees to assist the Company in every way (at the Company's expense) to obtain and from time to time to enforce patents on the Inventions in any and all countries. To that end, by way of illustration but not limitation, Consultant will testify in any suit or other proceeding involving any of the Inventions, execute all documents that the Company reasonably determines to be necessary or convenient for use in applying for and obtaining patents thereon and enforcing the same, and execute all necessary assignments thereof to the Company or entities designated by it. Consultant's obligation to assist the Company in obtaining and enforcing patents for the Inventions shall continue beyond the engagement

termination, but the Company shall compensate Consultant at your established consulting rate after such termination for time actually spent by Consultant at the Company's request on such assistance.

9. Power of Attorney

Consultant hereby grants to the Company a general power of attorney to file patent applications on Inventions in any country in Consultant's name and to execute any document connected with such a filing or the prosecution of a patent application naming Consultant as an inventor on behalf of Consultant.

10. List of Prior Inventions

All inventions, if any, which Consultant made prior to engagement by the Company which are to be excluded from the scope of his agreement are set forth in Exhibit A attached hereto. Consultant represents and covenants that this is a complete list of all inventions, discoveries, or improvements that have been made by Consultant prior to engagement with the Company.

11. Injunction

Consultant agrees that it would be difficult to measure damage to the Company from any breach by Consultant of the promises set forth in Paragraphs 4, 5, 6, 7, and 8 herein; that injury to the Company from any such breach would be impossible to calculate, and that money damages would therefore be an inadequate remedy for any such breach. Accordingly, Consultant agrees that if Consultant breaches any provision of these Paragraphs, the Company shall be entitled, in addition to all other remedies it may have, to injunctions or other appropriate orders to restrain any such breach by Consultant without showing or proving any actual damage sustained by the Company.

12. General

(a) To the extent that any of the agreements set forth herein, or any word, phrase, clause or sentence thereof, shall be found to be illegal or unenforceable for any reason, such agreement, word, clause, phrase, or sentence shall be modified or deleted in such manner as to make the agreement as modified legal and enforceable under applicable laws, and the balance of the agreements or part thereof shall not be affected thereby, the balance being construed as severable and independent.

(b) This Agreement shall be binding upon Consultant and Consultant's heirs, executors, assigns, and administrators and shall inure to the benefit of the Company, its successors and assigns, and any Subsidiary.

(c) This Agreement shall be governed by the laws of the State of Massachusetts, which state shall have jurisdiction of the subject matter hereof.

(d) This Agreement may be signed in two counterparts, each of which shall be deemed an original and that together shall constitute one instrument.

(e) The use of the singular in this Agreement includes the plural, as appropriate.

(f) This Agreement represents the entire agreement between Consultant and the Company with respect to the subject matter hereof, superseding all previous oral or written communications, representations, or agreements. This Agreement may be modified only by a duly authorized representative of the Company and said modification must be executed in writing.


Aware

Consultant

Dated: 2/26/91

Dated: 2/26/91

By 
(Signature)


(Signature)

CHARLES S. SMITH

(Typed or Printed Name)

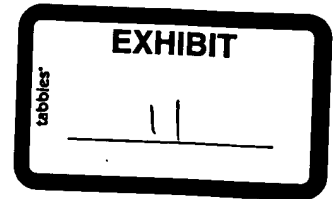
SRI RAM JAYASIMHA

(Typed or Printed Name)

EXHIBIT A
LIST OF CONSULTANT'S INVENTIONS

List each invention, if any, related to the Company's business by title and with a brief summary. State when made and conceived and whether or not a patent has been applied for. Do not list any confidential information.

1. Dither generators for digital audio compression
2. Direct and lattice form implementations / design of noise shaping filters for digital audio based on psychoacoustics

EXHIBIT D

CONSULTING AGREEMENT

THIS AGREEMENT is between Aware, Inc., a Massachusetts corporation with principal offices at One Memorial Drive, 4th Floor, Cambridge, MA 02142 (hereinafter "the Company"), and John Stautner, (hereinafter "the Consultant"):

WHEREAS, Consultant has been or is being employed by the Company to work in the Target Area, as defined below, because of Consultant's intellectual character and extraordinary ability in the Target Area; and

WHEREAS, said employment is of a confidential nature involving duties that require the Company to impose on Consultant the highest trust and confidence;

NOW, THEREFORE, in consideration of the initiation or the continuation of employment, and of other good and valuable consideration received by Consultant, receipt of which is hereby acknowledged, and of the mutual promises and covenants contained herein, the parties agree as follows:

1. Definitions

a. Target Area

The term "Target Area" shall refer to digital systems and methods for coding audio signals such that the coded signals require fewer bits to represent than the uncoded signals. The areas listed in Exhibit A attached hereto are deemed to be outside the Target Area.

b. Wavelets

The term "Wavelets" shall refer to the mathematics and applications of said mathematics related to functions satisfying the recursion relation:

$$F(x) = \sum_i a_i F(mx-i)$$

Where m is an integer and $\{a_i\}$ for $i = 1$ to N are complex numbers. Said summation being carried out from 1 to N .

c. Affiliate

As used herein, the term "Affiliate" means (1) any entity in which the Company or any of its stockholders, directors or officers has a direct or indirect ownership interest (other than insubstantial interests in publicly held companies) or (2) any entity which directly or indirectly through one or more intermediaries, controls, is controlled by, or is under common control with the Company. A list of Affiliates and the relevant business activities thereof will be provided to Consultant upon written request by Consultant.

d. Proprietary Information

As used herein, the term "Proprietary Information" refers to any and all information in the Target Area or related to Wavelets of a confidential, proprietary, or secret nature that is or may be either applicable to, or related in any way to (i) the business, present or future, of the Company or any Affiliate, or (ii) the research and development or investigations of the Company or of any Affiliate. Proprietary Information includes, for example and without limitation, trade secrets, processes, formulas, data, know-how, improvements, inventions, techniques, marketing plans and strategies, and information concerning customers or vendors. Notwithstanding the above, the information listed in Exhibit A attached hereto shall not be considered Proprietary Information. The Company agrees to make a determination, upon written request, as to whether any specific information is Proprietary Information within the meaning of this agreement. Should said determination indicate that the information is Proprietary, the Company shall provide Consultant with its reasoning in arriving at that conclusion.

e. Inventions

As used herein, the term "Inventions" refers to all inventions, computer programs, discoveries, improvements, trade secrets, formulas, techniques, processes, confidential information, and know-how, whether or not patentable and whether or not reduced to practice, conceived or learned by Consultant during the period of employment, either alone or jointly with others, which relate to the Target Area or Wavelets or result from the actual or anticipated business, work, research, or investigations of the Company, or any Affiliate, in the Target Area or related to Wavelets, or which result, to any extent, from use of the Company's premises or property. The Company agrees to make a determination, upon written request, as to whether any specific invention, computer program, discovery, etc is an Invention within the meaning of this agreement.

2. Employment

The Company has hired Consultant to work in the Target Area on a project by project basis. Each project and the compensation therefor will be specified in a written project agreement signed by an officer of Company and Consultant. The specific terms of said project agreements shall take precedent over the terms of this agreement to the extent that such specific terms are in conflict with the terms of this agreement. A breach of the specific terms of any project agreement shall not relieve the parties of their duties with respect to the terms of this agreement or other project agreements.

This employment is not for any particular period, and may be terminated, with or without cause at any time.

3. Confidential Information of Others

If the Consultant possesses any confidential information or documents belonging to others, Consultant will not use, disclose to the Company, or induce the Company to

use, any such information or documents during his employment. Consultant represents that his employment will not require Consultant to violate any obligation to or confidence with another.

4. Proprietary Information to be Kept In Confidence

Consultant acknowledges that the Proprietary Information is a special, valuable, and unique asset of the Company, and Consultant agrees at all times during the period of employment and thereafter to keep in confidence and trust all Proprietary Information. Consultant agrees that during the period of employment and thereafter Consultant will not directly or indirectly use the Proprietary Information other than in the course of performing duties as an Consultant of the Company, nor will Consultant directly or indirectly disclose any Proprietary Information or any information relating thereto to any person or entity, except in the course of performing duties as an Consultant of the Company and with the written consent of the Company. Consultant will abide by the Company's policies and regulations, as established and revised from time to time, for the protection of its Proprietary Information.

Company acknowledges that the information included in Exhibits A and B attached hereto include proprietary information of Consultant. Company agrees to hold such information in confidence and to treat such information with the same degree of care as it treats its own proprietary information.

5. Other Employment

Consultant agrees that during the period of employment by the Company, Consultant will not, without the Company's prior written consent, directly or indirectly engage in any employment, consulting, or activity other than for the Company relating to any line of business in which the Company is now or at such time engaged, or which would otherwise conflict with Consultant's obligations to the Company. The Company acknowledges Consultant's current obligations to as listed in Exhibit B. The Consultant warrants that none of these existing relationships conflicts with Consultants work under this agreement. The Company agrees to make a determination, upon written request, as to whether any specific employment violates this section. The Company will not unreasonably restrict Consultant's other employment under the provisions of this section.

6. Covenant Not to Compete

(a) Without the prior express written consent of the Company, during the period in which Consultant is employed by the Company, Consultant agrees not to directly or indirectly anywhere in the world:

(i) engage or participate (with or without compensation) in any commercial research or commercial project which is the same or substantially similar (in purpose, objective, or result) to any research or project in which the Company or its Affiliates engaged, participated or researched during the employment period; or

(ii) during Consultant's employment or for a period of one year thereafter, recruit or otherwise solicit or induce any employees of the Company or any of its Affiliates to terminate their employment with, or otherwise cease their

relationship with the Company or any of its Affiliates.

(b) The restrictions against competition set forth in Paragraph 6(a) are considered by the parties to be reasonable for the purposes of protecting the business of the Company. However, if any such restriction is found by a court of competent jurisdiction to be unenforceable because of its temporal extent, geographic extent, or breath of activities, it shall be interpreted to extend only over the maximum period of time, range of activities, or geographic areas as to which it may be enforced.

7. Return of Materials at Termination

At the termination of employment with the Company for any reason, Consultant will promptly deliver to the Company, or any Affiliate designated by it, all Company documents, data, records, and other information, and Consultant shall not take any documents or data, or any reproduction or excerpt of any documents or data, containing or pertaining to any Proprietary Information.

8. Disclosure of Inventions to the Company

Consultant agrees promptly to disclose in writing to the Company any and all Inventions related to the Target Area or Wavelets. For the purpose of this Agreement, an Invention is deemed to have been made during the period of employment if, during such period, the invention was conceived or first actually reduced to practice. Consultant further agrees to disclose to the Company in writing and in confidence all patent applications naming Consultant as an inventor which are filed within one year after the termination of employment with Company.

9. Inventions as Sole Property of Company

Consultant acknowledges and agrees that all the Inventions in the Target Area or Wavelets shall be the sole property of the Company or any other entity designated by it, and Consultant hereby assigns to the Company Consultant's entire right and interest in all such Inventions. Consultant will not use for his own benefit, directly or indirectly, any of said Inventions. The Company or any other entity designated by it shall be the sole owner of all domestic and foreign rights pertaining to said Inventions. Consultant further agrees to assist the Company in every way (at the Company's expense) to obtain and from time to time to enforce patents on said Inventions in any and all countries. To that end, by way of illustration but not limitation, Consultant will testify in any suit or other proceeding involving any of said Inventions, execute all documents that the Company reasonably determines to be necessary or convenient for use in applying for and obtaining patents thereon and enforcing the same, and execute all necessary assignments thereof to the Company or entities designated by it. Consultant's obligation to assist the Company in obtaining and enforcing patents for said Inventions shall continue beyond the employment termination, but the Company shall compensate Consultant at Consultant's established consulting rate after such termination for time actually spent by Consultant at the Company's request on such assistance.

10. Power of Attorney

Consultant hereby grants to the Company a general power of attorney to file patent applications on Inventions in any country in Consultant's name and to execute any document connected with such a filing or the prosecution of a patent application naming

Consultant as an inventor on behalf of Consultant.

11. List of Prior Inventions

All inventions, if any, which Consultant made in the Target Area or Wavelets prior to employment by the Company which are to be excluded from the scope of this Agreement are set forth in Exhibit A attached hereto. Consultant represents and covenants that this is a complete list of all inventions, discoveries, or improvements relating to the Company's business that have been made by Consultant prior to employment with the Company.

12. Right to License Technology

Should Company terminate its activities in the Target Area, Company agrees to provide a license to the inventions produced by Consultant under this agreement. The terms of said license shall be negotiated in good faith in the event Company terminates its activities in the Target Area. Company will be deemed to have terminated its activities in the Target Area if it has suspended all research and development activities in the Target Area for a period of three years and has no outstanding license agreements with other parties in the Target Area.

13. Injunction

Consultant agrees that it would be difficult to measure damage to the Company from any breach by Consultant of the promises set forth in Paragraphs 3, 4, 5, 6, and 7 herein; that injury to the Company from any such breach would be impossible to calculate, and that money damages would therefore be an inadequate remedy for any such breach. Accordingly, Consultant agrees that if Consultant breaches any provision of these Paragraphs, the Company shall be entitled, in addition to all other remedies it may have, to injunctions or other appropriate orders to restrain any such breach by Consultant without showing or proving any actual damage sustained by the Company.

14. Arbitration

Any controversy or claim arising out of or relating to this contract, or the breach thereof, shall be settled by arbitration in accordance with the Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the Arbitrator(s) may be entered in any Court having jurisdiction thereof.

15. General

(a) To the extent that any of the agreements set forth herein, or any word, phrase, clause or sentence thereof, shall be found to be illegal or unenforceable for any reason, such agreement, word, clause, phrase, or sentence shall be modified or deleted in such manner as to make the agreement as modified legal and enforceable under applicable laws, and the balance of the agreements or part thereof shall not be affected thereby, the balance being construed as severable and independent.

(b) This Agreement shall be binding upon Consultant and Consultant's heirs, executors, assigns, and administrators and shall inure to the benefit of the Company, its successors and assigns, and any Affiliate.

(c) This Agreement shall be governed by the laws of the State of Cali-

forma, which state shall have jurisdiction of the subject matter hereof.


(d) This Agreement may be signed in two counterparts, each of which shall be deemed an original and that together shall constitute one instrument.

(e) The use of the singular in this Agreement includes the plural, as appropriate.

(f) This Agreement represents the entire agreement between Consultant and the Company with respect to the subject matter hereof, superseding all previous oral or written communications, representations, or agreements. This Agreement may be modified only by a duly authorized representative of the Company and said modification must be executed in writing.

Aware


Dated: 26 November 1990

By 
(Signature)

Charles S. SMITH
(Typed or Printed Name)

Consultant

Dated:


NOV. 26, 1990
(Signature)

JOHN P. STANDNER
(Typed or Printed Name)

EXHIBIT A
LIST OF CONSULTANT'S INVENTIONS AND INFORMATION TO BE
EXCLUDED FROM PROPRIETARY INFORMATION

List each invention, if any, related to the Company's business by title and with a brief summary. State when made and conceived and whether or not a patent has been applied for. Do not list any confidential information.

EXHIBIT B**LIST OF OTHER ACTIVITIES IN WHICH CONSULTANT IS ENGAGING DURING THE COURSE OF THIS AGREEMENT****1. Research on the Following Algorithms:****a. CROSS-CHANNEL ANALYSIS**

For this description, a frame of audio consists of two or more channels of sampled audio data. For example, N left channel samples and N right samples of a sampled stereo audio signal would comprise a frame with two blocks of length N. The sampled audio signals are analyzed a block at a time to construct an encoded data set describing those samples.

Compute the signals

$$y_l = \sum_k (w_{lk} x_k[n-d_{lk}])$$

where k is the block index in the frame, and l is an analysis index, and the w's are integer weights. The d's are delays with values from zero samples and up. Samples from the previous frame(s) must still be available to compute the y's. Assume there are K channels, and therefore K blocks in the frame. Pick K signals from the set of $y_l[n]$ for the frame such that the K signals chosen have the smallest maximum absolute value. The signals chosen are then packed to the word size determined by the maximum absolute value. This packed data and the K chosen indices of l are formatted and transmitted or stored.

b. CROSS-CHANNEL SYNTHESIS

The original sampled signals x_k may be exactly reconstructed from the system of K equations given by (1). Consider, for example, resynthesis of signal $w_{lk} x_k[n]$ shown below. The values are determined by the signals $y_l[n]$ plus integer weights of previous samples from the other channels in the frame. Of course, solution for any particular set of l's is done generally by considering all the K equations for each sample value n in the frame.

$$w_{lk} x_k[n] = y_l[n] - \sum_{k' \neq k} (w_{lk'} x_{k'}[n-d_{lk'}])$$

The samples $x_k[n]$ can be recovered exactly since w_{lk} is integer (as are all w's)

c. CROSS-CHANNEL ALGORITHMS WITH OTHER ALGORITHMS

The cross-channel algorithm may be combined with other reduction algorithms. For example, it can be used to pre-process a multi-channel audio signal prior to further lossless processing by a digital filter array algorithm. It can be used to process two or more channels at each particular frequency in a multi-band analysis, so that similar bands are compared with each other and multiplexed. For that matter, it may even be useful within a single channel's multi-band analysis, where the demodulated outputs might be treated as individual channels

for the algorithm to operate on. The algorithm may also be combined with commonly known entropy coders such as Huffman and variable length codes.

Note also the algorithm representation of equation 1 may be further generalized to compute the signals given by

$$y_l[n] = \sum_k (w_k x_k[n-d_k]) + \sum_j (u_j y_j[n-D_j])$$

for integer weights u and sample delays D , which may be used in the same manner as described above.

d. IMAGE COMPRESSION USING N-DIMENSIONAL DIGITAL FILTER ARRAY

The digital filter array algorithm is a lossless algorithm which has been applied to audio data compression and has been described in generally in publications (see list). The basic principles may also be applied to image processing, where the filter operate in two dimensions (single image or three dimensions (motion sequence)).

ANALYSIS

A family of two-dimensional filters is defined which may be addressed by an index. The coefficients at each filter location (x, y) are integer values. The image may be partitioned into sub-images or processed whole. For each image partitions, filter the image by each of the filters in the family, and compute the values of the maximum absolute value of the output. the filtered output and filter index corresponding to the output with the smallest maximum absolute value is selected. This output is packed to the minimum word size requirement and may further be coded using entropy coding methods such as Huffman coding or variable length codes. The encoded data is stored or transmitted.

This approach may be further extended to three-dimensional processing for motion sequence, where the filter family consist of three dimensional filters with integer coefficients at each filter location (x, y, t) .

SYNTHESIS

Synthesis is accomplished by running the encoded data through the inverse filter as specified by the stored or transmitted filter index for the given image partition. Reconstruction is exact since all filter coefficients are integers and there are no round-off errors.

The requirement for image reconstruction starting at an arbitrary partition, or for motion sequence reconstruction starting arbitrary frame, may require that certain initial values are stored or transmitted as well for initialization of the filters during synthesis.

Further data compression may be achieved by allowing lossless operation. This is done by scaling and quantizing the signal prior to the lossless

processing stage. During resynthesis, the signal is de-scaled after the lossless reconstruction stage.

c. EXTENSIONS OF THE CSX ALGORITHMS

The digital Multimedia extended CSX algorithm consist of one or more of the following digital signal processing software components which may be supported on a variety of dsp hardware platform:

1. Basic CSX algorithm structures, licensed from Compusonics.
2. Additional filter types in digital filter array algorithm.
3. Addition of Cross Channel algorithm, description attached.
4. Modification of output data packing for greater efficiency.
5. Addition of entropy coding methods, e.g. Huffman or variable length codes.
6. Dynamic control of threshold parameter based on bit-rate and/or signal quality consideration

2. Consulting for the following Clients in the Designated Areas

1. Symetrix

Design and development of real-time operating software for professional digital audio workstation. Although my activities are primarily oriented toward the real-time operating software development, my advice regarding DSP issues is requested from time to time. This has included, and is expected to include in the future, advice regarding the possible selection and incorporation of compression algorithms into Symetric products.

2. Silicon Graphics Computer Systems, Inc.

Generally advice regarding design approaches and digital signal processing for multimedia market. Mostly oriented toward audio processing and software. Issues may include selection, use, integration of data compression processing algorithms.

3. CompuSonics Corp.

Activities include occasional maintenance and upgrades to real-time operating software and existing CSX data compression algorithms and development environment, parting of algorithms, and occasional consulting based on familiarity with the company's technology gained during previous employment.

4. Sornitech International, Inc.

Joint development agreement to develop MPEG audio algorithm, to be signed with Aware's knowledge and approval.

5. Digital Multimedia Associates

Ongoing research and development to build a base of software and digital signal processing components for sale by Digital Multimedia Associates into the multimedia market. This includes market research and development of technical specifications for a corporate video computer; research and development of audio reverberation and spatial positioning algorithms; real-time software and signal processing components (not data compression); integration of off-the-shelf components into computer platforms.

Audio Compression Related: licensing and porting of Compusone CSX audio compression algorithms; Extensions to the CompuSonics CSX audio algorithm (described above).

**PATENT APPLICATION**

Attorney Docket: 54140

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Tzannes, et al.
Serial No.: 08/804.909
Filed: 2/25/97
For: MULTI-CARRIER
TRANSMISSION SYSTEM
UTILIZING CHANNELS OF
DIFFERENT BANDWIDTH

PETITION UNDER 37 C.F.R. 1.47

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

This is a petition to allow Aware, Inc. to execute the Declaration for Patent Application in the above identified on behalf of Mr. Stautner and Mr. Jayasimha.

1. Harm to Aware if this petition is not granted.

The above identified patent application is a continuation-in-part of U.S. Patent Application Serial Number 08/307,331 which is a divisional application of Serial Number 07/948,147 on which each of these inventors is a named inventor. If this petition is not granted, Aware, Inc. will suffer irreparable harm by losing the benefit of the filing date of September 21, 1992 of the 07/948,147 application.

2. Aware's Proprietary Interest

These inventors have assigned their entire right and interest in the subject matter of 07/948,147 to Aware, Inc. These assignments are recorded at Reel/Frame 6332/0751 and 6299/914. I have interviewed inventors Tzannes and Heller and, on information and

belief based on these interviews, any new matter added to this application that was not disclosed in 07/948,147 was invented by inventors Tzannes and Heller.

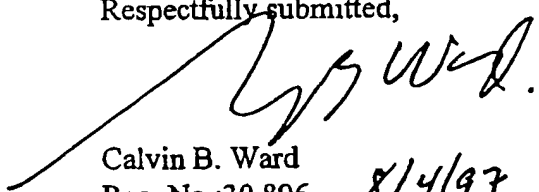
In addition, Mr. Stautner and Mr. Jayasimha were further under a duty to assign any inventions made by them to Aware, Inc. Copies of the employment agreements of these inventors are attached hereto as Exhibits C and D.

3. Aware has made a bona fide attempt to comply obtain the signatures of Mr. Stautner and Mr. Jayasimha on the Declaration.

I have tried to locate Mr. Jayasimha to seek his signature on a Declaration for Patent Application in the above identified patent application. In particular, I caused a letter to be sent by Express mail (EI497254179US) on July 15, 1997 to his last known address. This letter was returned as undeliverable. A copy of this letter is attached hereto as Exhibit A.

Similarly, I have tried to locate Mr. Stautner to seek his signature on a Declaration for Patent Application in the above identified patent application. In particular, I caused a letter to be sent by Express mail (EI497254182US) on July 15, 1997 to his last known address. This letter was returned as undeliverable. A copy of this letter is attached hereto as Exhibit B.

Respectfully submitted,


Calvin B. Ward
Reg. No.:30,896

8/4/97

18 Crow Canyon Rd, #305
San Ramon, CA 94583
510-855-0413
510-855-9214(FAX)

DECLARATION FOR PATENT APPLICATION

As a below named inventor, we hereby declare that:

Our residence, post office address and citizenship are as stated below next to our name.

We believe we are the original, first, and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled

**"MULTI-CARRIER TRANSMISSION SYSTEM UTILIZING CHANNELS OF
DIFFERENT BANDWIDTH"**

U.S. Serial Number 08/804,909 filed 2/25/97

We hereby state that we have reviewed and understand the contents of the above-identified specification, including the claims as amended by any amendment referred to above.

We acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

We hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and so identified, and we have also identified below any foreign application for patent or inventor's certificate on this invention filed by us or our legal representatives or assigns and having a filing date before that of the application on which priority is claimed.

<u>Number</u>	<u>Country</u>	<u>Day/Month/Year Filed</u>	<u>Priority Claimed - Yes or No</u>
NONE			

We hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, we acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

<u>Application Serial No.</u>	<u>Filing Date</u>	<u>Status</u>
08/307,331	09/16/94	Allowed

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

We hereby appoint the following attorney, with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith and request that all correspondence and telephone calls in respect to this application be directed to Calvin B. Ward, 18 Crow Canyon Court, Suite 305, San Ramon, California 94583, telephone 510-855-0413:

<u>Attorney</u>	<u>Reg. No.</u>
Calvin B. Ward	30,896

Full name of first joint inventor: Michael A. Tzannes

Inventor's signature:



Date:

8/4/97

Residence and Post Office Address: 63 Kingswood Road
Newton, MA 02166

Citizenship: United States

Full name of second joint inventor: Peter Niels Heller

Inventor's signature:



Date:

7/31/97

Residence and Post Office Address: 24 Powderhouse Terrace, Apt. 2
Somerville MA 02144

Citizenship: United States

Full name of third joint inventor: John P. Stautner

Inventor's signature: John Stautner **Date:** 7/31/97

by David Hunter, David Hunter, Senior Vice President, Aware, Inc.

Residence and Post Office Address: UNKNOWN

Citizenship: United States

Full name of fourth joint inventor: William R. Morrell

Inventor's signature: _____ **Date:** _____

Residence and Post Office Address: 401 E. Mercer St., #8
Seattle, WA 98102

Citizenship: United States

Full name of fifth joint inventor: Sriram Jayasimha

by David Hunter, David Hunter, Senior Vice President, Aware, Inc.

Inventor's signature: Sriram Jayasimha **Date:** 7/31/97

Residence and Post Office Address: UNKNOWN

Citizenship: India

DECLARATION FOR PATENT APPLICATION

As a below named inventor, we hereby declare that:

Our residence, post office address and citizenship are as stated below next to our name.

We believe we are the original, first, and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled

**"MULTI-CARRIER TRANSMISSION SYSTEM UTILIZING CHANNELS OF
DIFFERENT BANDWIDTH"**

U.S. Serial Number 08/804,909 filed 2/25/97

We hereby state that we have reviewed and understand the contents of the above-identified specification, including the claims as amended by any amendment referred to above.

We acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

We hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and so identified, and we have also identified below any foreign application for patent or inventor's certificate on this invention filed by us or our legal representatives or assigns and having a filing date before that of the application on which priority is claimed.

<u>Number</u>	<u>Country</u>	<u>Day/Month/Year Filed</u>	<u>Priority Claimed - Yes or No</u>
NONE			

We hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, we acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

<u>Application Serial No.</u>	<u>Filing Date</u>	<u>Status</u>
08/307,331	09/16/94	Allowed

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

We hereby appoint the following attorney, with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith and request that all correspondence and telephone calls in respect to this application be directed to Calvin B. Ward, 18 Crow Canyon Court, Suite 305, San Ramon, California 94583, telephone 510-855-0413:

<u>Attorney</u>	<u>Reg. No.</u>
Calvin B. Ward	30,896

Full name of first joint inventor: Michael A. Tzannes

Inventor's signature: _____ **Date:** _____

Residence and Post Office Address: 63 Kingswood Road
Newton, MA 02166

Citizenship: United States

Full name of second joint inventor: Peter Niels Heller

Inventor's signature: _____ **Date:** _____

Residence and Post Office Address:

Citizenship: United States

**Full name of third
joint inventor:** John P. Stautner

Inventor's signature: _____ **Date:** _____

**Residence and Post
Office Address:** 12 Pine Ridge Road
Wellesley Hills, MA 02181

Citizenship: United States

**Full name of fourth
joint inventor:** William R. Morrell

Inventor's signature: Will R. Morrell **Date:** 30-July-1997

**Residence and Post
Office Address:** 401 E. Mercer St., #8
Seattle, WA 98102

Citizenship: United States

**Full name of fifth
joint inventor:** Sriram Jayasimha

Inventor's signature: _____ **Date:** _____

**Residence and Post
Office Address:** 1 Longfellow Place, Apt. 1020
Boston, MA 02114

Citizenship: India

EXHIBIT A

THE LAW OFFICES OF
Dr. CALVIN B. WARD

18 Crow Canyon Court, Suite 305
San Ramon, CA 94583

Telephone (510) 855-0413
FAX (510) 855-9214
Email 74757.2701@compuserve.com

July 15, 1997

Sriram Jayasimha
2602 Stearns Hill Rd., Apt 1020
Waltham, MA 02154

EI497254179US

Re: Multi-Carrier Transmission System Utilizing Channels of Different Bandwidth

Our File No.:54140

Dear Sriram,

Aware has filed a continuation-in-part application based on U.S. Patent application 08/307,331 on which you are listed as an inventor. Accordingly, you have been named as an inventor on the continuation-in-part application. Aware is giving you an opportunity to execute the Declaration and Assignments connected with the continuation-in-part application. If you do not wish to execute these documents, please so advise me as soon as possible. If you are willing to execute the documents, please so advise me, and I will send you a copy of the application and the formal papers. If we do not receive a reply to this letter by August 1, 1997, we will assume that you are not willing to cooperate in the execution of these documents.

If you have any questions about this matter, please call me as soon as possible.

Very truly yours,

Calvin B. Ward
Calvin B. Ward *sk*

EXHIBIT B

THE LAW OFFICES OF
Dr. CALVIN B. WARD18 Crow Canyon Court, Suite 305
San Ramon, CA 94583Telephone (510) 855-0413
FAX (510) 855-9214
Email 74757.2701@compuserve.com

July 15, 1997

EI497254182US

Mr. John Stautner
18 Tennyson Road
Wellesley, MA 02181

Re: Multi-Carrier Transmission System Utilizing Channels of Different Bandwidth

Our File No.:54140

Dear Mr. Stautner,

Aware has filed a continuation-in-part application based on U.S. Patent application 08/307,331 on which you are listed as an inventor. Accordingly, you have been named as an inventor on the continuation-in-part application. Aware is giving you an opportunity to execute the Declaration and Assignments connected with the continuation-in-part application. If you do not wish to execute these documents, please so advise me as soon as possible. If you are willing to execute the documents, please so advise me, and I will send you a copy of the application and the formal papers. If we do not receive a reply to this letter by August 1, 1997, we will assume that you are not willing to cooperate in the execution of these documents.

If you have any questions about this matter, please call me as soon as possible.

Very truly yours,

Calvin B. Ward

Calvin B. Ward SK